

IN THE CLAIMS:

Please AMEND claims 10, 15, and 16, as follows.

1. to 9. (Cancelled).

10. (Currently Amended) An image processing apparatus for compositing ~~compositing~~ an image of a virtual object and an image of a physical space to generate a mixed reality image and causing a HMD to display the mixed reality image, comprising:

a database which holds 3D CG data used for generating the image of the virtual object and scene graph data, wherein the 3D CG rendering data contains data representing geographical shape and color of the virtual object, texture data, and data representing the position and orientation of the virtual object, and wherein the scene graph data is data in which the 3D CG rendering data is hierarchically managed on the basis of the parent-child relationship between components of the virtual object;

an image capturing unit which is attached to the HMD and captures the image of the physical space;

a first measurement unit which measures a position and orientation of the HMD;

an object manipulation unit which is used by a user wearing the HMD in order to operate a position and orientation of the virtual object;

a second measurement unit which measures a position and orientation of said object manipulation unit;

an operation panel which can be operated by the user, arranged at a position in the physical space within a viewing field of said image capturing unit attached to the HMD, displays an operation panel image which is used for editing the virtual object and contains a region for hierarchically displaying information about each of the components in accordance with the scene graph data held in the database, and is capable of receiving a user instruction of editing the virtual object input by the user;

an operation panel image generation unit which generates the operation panel image by using the data held in said database, and outputs the generated operation panel image to said operation panel;

a rendering unit which updates the data held in said database according to the user instruction received via said operation panel and the measurement result of said second measurement unit, and renders, by using the updated data, the image of the virtual object according to the measurement results of said first and second measurement units;

a composition unit which composites the image of the virtual object rendered by said rendering unit and the image of the physical space captured by said image capturing unit to generate the mixed reality image; and

a HMD, to which said image capturing unit is attached, which displays the mixed reality image generated by said composition unit.

11. (Previously Presented) The apparatus according to claim 10, wherein the image of the virtual object is generated on the basis of 3D CAD data of the virtual object, and said operation panel displays an assembly tree based on the 3D CAD data.

12. (Previously Presented) The apparatus according to claim 11, wherein a part, which is obtained by enlarging a designated part of the assembly tree included in the operation panel image, includes a component name contained in the assembly tree.

13. (Previously Presented) The apparatus according to claim 10, wherein said operation panel includes a display device and an operation device, wherein the display device displays the operation panel image, and wherein the operation device is used for inputting the user instruction.

14. (Previously Presented) The apparatus according to claim 10, wherein the HMD can present the mixed reality image to two eyes of a user who wears the HMD.

15. (Currently Amended) An image processing method of compositing ~~compositing~~ an image of a virtual object and an image of a physical space to generate a mixed reality image and causing a HMD to display the mixed reality image, comprising the steps of:
holding 3D CG rendering data ~~used for generating the image of the virtual object in a database~~ and scene graph data, wherein the 3D CG rendering data contains data representing geographical shape and color of the virtual object, texture data, and data representing the position and orientation of the virtual object, and wherein the scene graph data is data in which the 3D CG rendering data is hierarchically managed on the basis of the parent-child relationship between components of the virtual object;

providing an image capturing unit, which is attached to the HMD, to capture

the image of the physical space;

measuring a position and orientation of the HMD with a first measurement unit;

operating an object manipulation unit, by a user wearing the HMD, in order to position and orient the virtual object;

measuring a position and orientation of the object manipulation unit with a second measurement unit;

receiving a user instruction of editing the virtual object, input by the user using an operation panel, wherein the operation panel is arranged at a position in the physical space within a viewing field of the image capturing unit attached to the HMD and displays an operation panel image which is used for editing the virtual object, and contains a region for hierarchically displaying information about each of the components in accordance with the scene graph data held in the database;

generating the operation panel image by using the data held in the database with an operation panel image generation unit and outputting the generated operation panel image to the operation panel;

updating the data held in the database according to the user instruction received via the operation panel and the measurement result of the second measurement unit, and rendering, by using the updated data, the image of the virtual object according to the measurement results of the first and second measurement units;

compositing the rendered image of the virtual object and the captured image of the physical space to generate the mixed reality image; and

displaying the generated mixed reality image on the HMD, to which the image capturing unit is attached.

16. (Currently Amended) A computer-readable storage medium encoded with a computer program for an image processing method of compositing ~~compositing~~ an image of a virtual object and an image of a physical space to generate a mixed reality image and causing a HMD to display the mixed reality image, comprising the steps of:

holding 3D CG rendering data used for generating the image of the virtual object in a database and scene graph data, wherein the 3D CG rendering data contains data representing geographical shape and color of the virtual object, texture data, and data representing the position and orientation of the virtual object, and wherein the scene graph data is data in which the 3D CG rendering data is hierarchical managed on the basis of the parent-child relationship between components of the virtual object;

providing an image capturing unit, which is attached to the HMD, to capture the image of the physical space;

measuring a position and orientation of the HMD with a first measurement unit;

operating an object manipulation unit, by a user wearing the HMD, in order to position and orient the virtual object;

measuring a position and orientation of the object manipulation unit with a second measurement unit;

receiving a user instruction of editing the virtual object, input by the user using

an operation panel, wherein the operation panel is arranged at a position in the physical space within a viewing field of the image capturing unit attached to the HMD and displays an operation panel image which is used for editing the virtual object, and contains a region for hierarchically displaying information about each of the components in accordance with the scene graph data held in the database;

generating the operation panel image by using the data held in the database with an operation panel image generation unit and outputting the generated operation panel image to the operation panel arranged at the position in the physical space within the viewing field of said image capturing unit;

updating the data held in the database according to the user instruction received via the operation panel and the measurement result of the second measurement unit, and rendering, by using the updated data, the image of the virtual object according to the measurement results of the first and second measurement units;

compositing the rendered image of the virtual object and the captured image of the physical space to generate the mixed reality image; and

displaying the generated mixed reality image on the HMD, to which the image capturing unit is attached.